

# PATENT ABSTRACTS OF JAPAN

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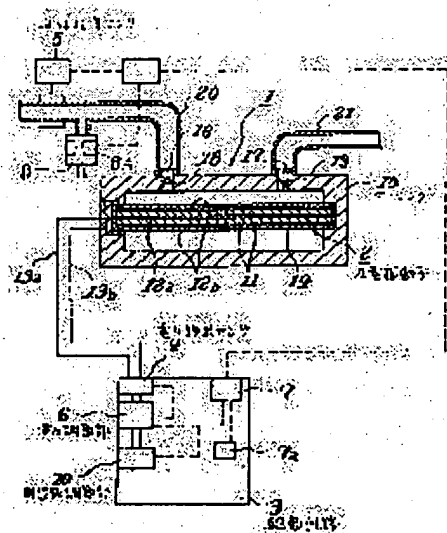
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## (54) QUANTITATIVE FORCE FEED METHOD OF FLUID

### (57)Abstract:

**PURPOSE:** To conduct highly efficient and highly precise force feed by detecting the input electric power of the piezoelectric vibrator of a piezoelectric pump and the viscosity of a liquid by respective sensors, and automatically controlling at least two of voltage regulation, frequency regulation, and regulation of diluted solution of the liquid.

**CONSTITUTION:** A piezoelectric element 2 having a piezoelectric film 11 and a film electrode 12a is fixed to a casing 15, and an intake port 16 and a discharge port 17 are provided to form a piezoelectric pump 1. The piezoelectric pump is driven by a driving circuit 3, and the outputs detected by a power detecting sensor 4 and a viscosity sensor 5 are inputted to a voltage regulating part 6 and a viscosity setting equipment 7a. These are compared with set values preliminarily set according to the flow rate, whereby the voltage is regulated and the diluted solution regulator of a diluted solution feed part 8 is operated. At least two of voltage, frequency, and diluted solution regulations are automatically controlled, and quantitative force feed of liquid can be conducted at high efficiency and high accuracy.



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